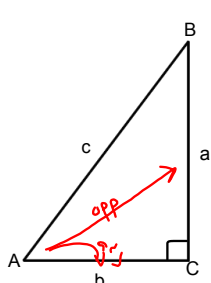


7-5 Apply the Tangent ratio

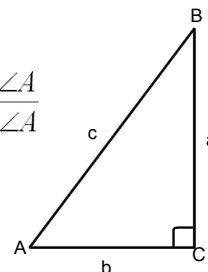


Side adjacent to $\angle A$ b
 Side opposite of $\angle A$ a

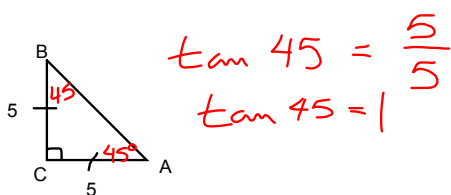
The tangent ratio

$$\tan A = \frac{\text{side opposite } \angle A}{\text{side adjacent } \angle A}$$

$$\tan A = \frac{a}{b}$$

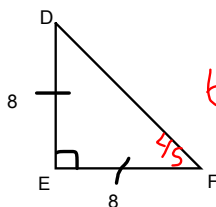


Trigonometry

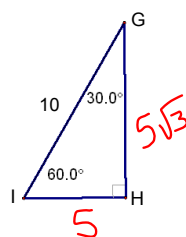


$$\tan 45 = \frac{5}{5}$$

$$\tan 45 = 1$$

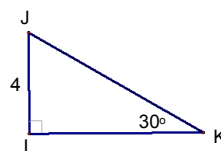


$$\tan 45 = \frac{8}{8}$$

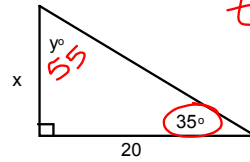


$$\tan 30 = \frac{5}{5\sqrt{3}}$$

$$\approx .5774$$



Every ^{acute} angle has a specific tangent value



$$\tan 35 = \frac{x}{20}$$

$$20 \cdot \tan 35 = x$$

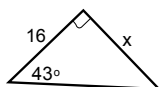
$$14.0 \approx x$$

$$\tan 55 = \frac{20}{x}$$

$$x \tan 55 = 20$$

$$x = \frac{20}{\tan 55}$$

$$x \approx 14.0$$



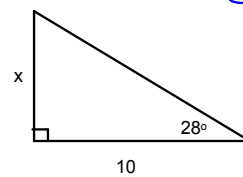
$$\tan 43 = \frac{x}{16}$$

$$16 \cdot \tan 43 = x$$

$$14.9 \approx x$$

Do:

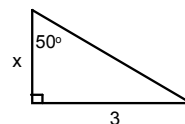
1.



$$\tan 28 = \frac{x}{10}$$

$$x \approx 5.3$$

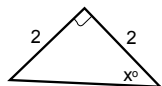
2.



$$\tan 50 = \frac{3}{x}$$

$$x \approx 2.5$$

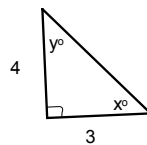
You can also find the angle if you have the legs.



$$\tan x = \frac{2}{2}$$

$$\tan^{-1}\left(\frac{2}{2}\right) = x$$

$$45^\circ = x$$



$$\tan y = \frac{3}{4}$$

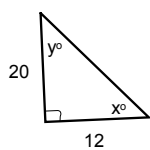
$$\tan^{-1}\left(\frac{3}{4}\right) = y$$

$$36.9^\circ \approx y$$

$$\tan x = \frac{4}{3}$$

$$\tan^{-1}\left(\frac{4}{3}\right) = x$$

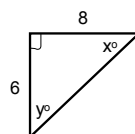
$$53.1^\circ \approx x$$



$$\tan x = \frac{20}{12}$$

$$x \approx 59.0^\circ$$

$$y \approx 31.0^\circ$$



Do:

